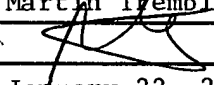
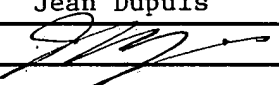


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	Filing Date	09/22/2003	
	First Named Inventor	Martin Tremblay / Jean Dupuis	
	Art Unit	3676	
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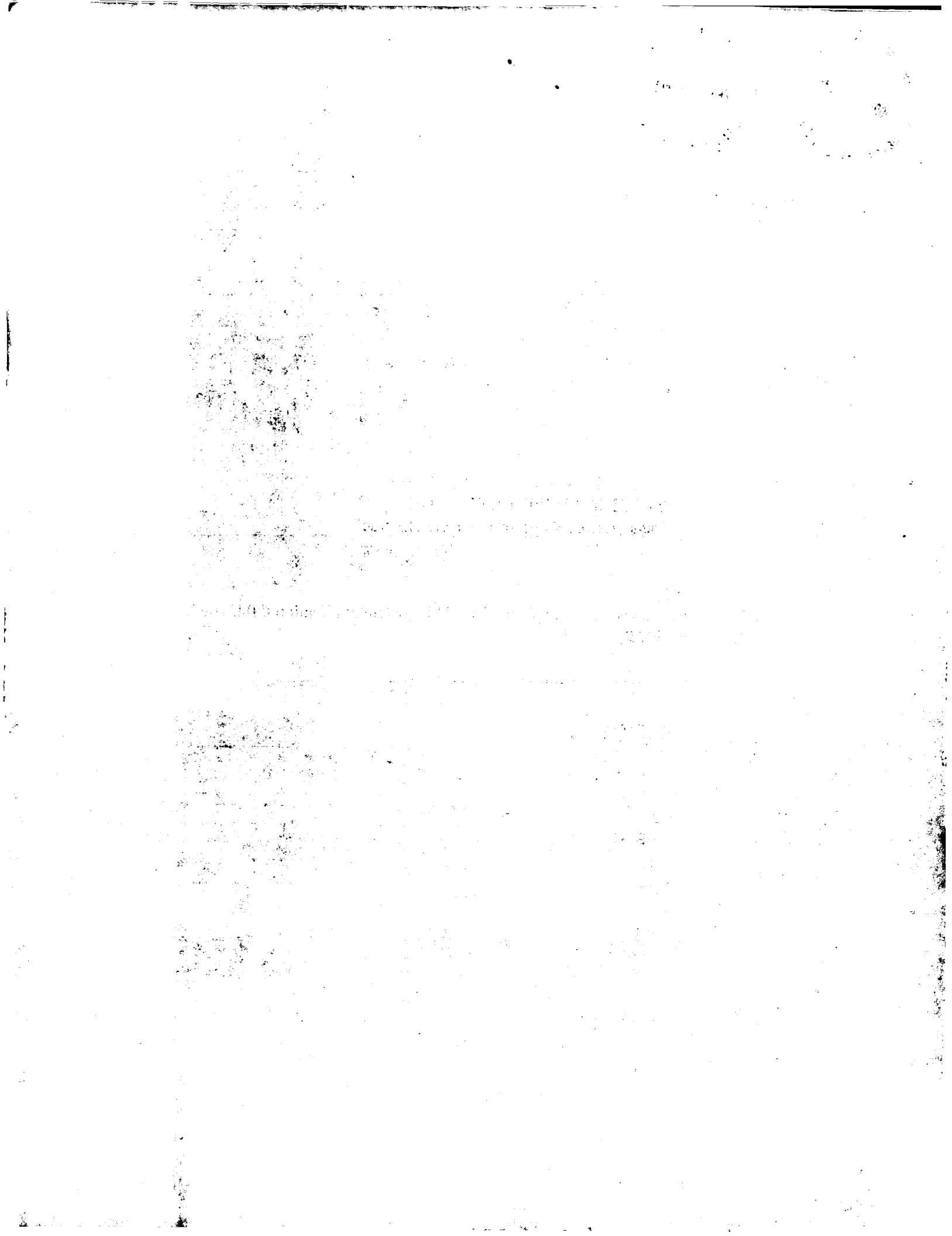
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Signed *AmBrewster*

Dated 14 October 2003



19SEP02 E749187-3 C05193
P01/7700 0.00-0221652.1

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The Patent Office

Cardiff Road
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1. Your reference

8662-4

2. Patent application number

(The Patent Office will fill in this part)

0221652.1

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

MARTIN TREMBLAY
7515, JOELLE
LAVAL-OUEST, QUEBEC
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JEAN DUPUIS
8169, LAJEUNESSE
MONTREAL, QUEBEC, CANADA
H2P 2E4

Patents ADP number (*if you know it*)

CUSTOMER ACCOUNT NUMBER C05193

If the applicant is a corporate body, give the country/state of its incorporation

7807381001

0467383001

4. Title of the invention

WINDOW HINGE HAVING IMPROVED LOCKING AND ADJUSTMENT FEATURES

5. Name of your agent (*if you have one*)

"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

INVENTION QUEBEC INC.
DELEGATION GENERALE DU QUEBEC
59, PALL MALL
LONGON, ENGLAND
SW1Y 5JH

5871199003

Patents ADP number (*if you know it*)

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Country

Priority application number
(*if you know it*)

Date of filing
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (*Answer 'Yes' if:*

- a) any applicant named in part 3 is not an inventor, or
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Request for substantive examination (Patents Form 10/77)

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11. XI/We request the grant of a patent on the basis of this application.

Signature:


MARTIN TREMBLAY

Signature


JEAN DUPUIS

Date Sept. 9th 2002

12. Name and daytime telephone number of person to contact in the United Kingdom (0171) 930-8314

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We, Martin Tremblay
Jean Dupuis

C/O Invention Quebec Inc.
4101 Jarry St. East, Suite 307
Montreal, Quebec, Canada H1Z 2H4

do hereby declare this invention to be described in the following statement:

**WINDOW HINGE HAVING IMPROVED LOCKING AND
ADJUSTMENT FEATURES**

FIELD OF THE INVENTION:

The present invention relates to the general field of windows and is particularly concerned with a window hinge having improved locking and adjustment features.

BACKGROUND OF THE INVENTION:

Exterior windows mounted in the walls of residential or commercial buildings are typically provided to allow for a view of the exterior and the transmission of light into the building. They are also expected to maintain a weather tight barrier against environmental elements such as wind and rain.

Preferably, exterior windows offer the capability of being opened for ventilation during favorable conditions.

Originally, most windows used particularly in residential settings were of the guillotine-type wherein there is provided either a fixed upper window portion and a moveable lower window portion or alternatively where upper and lower window portions are moveable. Subsequently, side opening crank-type windows became popular and many suitable mechanisms were developed for opening and closing the windows.

One particularly popular type of windows is the so-called sash-type window. Window hinges are known in the art for providing pivotal movement of the window between open and closed position. Typically, a hinge assembly mounts a window sash to a window frame and controls the opening and closing of the window.

Window hinges typically involve a generally elongated track mounted to the window frame, a sash arm mounted to the window sash and a support arm interconnecting the track and sash arms with the support arm being pivotally connected to both the track and the sash arms.

The sash arm is pivotally connected either directly or by means of an interconnecting link to a mounting shoe that is guided for movement lengthwise along the track. Typically, the sash arm is positioned opposite the track when the window is closed with the inside edge of the sash arm aligning with the inside edge of the track to ensure tight closing of the window.

Although somewhat useful and popular, conventional sash-type window arrangements suffer from some important drawbacks. Some of these drawbacks include that conventional window construction are not well suited to resist the potential for window failure in the event of the window assembly being subjected certain types of weather condition such as strong winds.

During storms, winds of high velocity typically cause a zone of high air pressure on and adjacent walls of buildings, relative to the air pressure within the building and relative to the air pressure within the sashes of windows located on the walls, particularly if the windows are snugly mounted. The high exterior air pressure typically generates a partial vacuum within the window sashes.

In a strong storm, an exterior window may be subjected to winds in excess of 160 km per hour. Wind loading can be sustained or can occur in gusts and ripples. To withstand such loading, structures require both static and dynamic strength and resilience. Particularly, in the event that the window subjected to a strong negative pressure, there is a risk that the shoe will be biased by the wind pressure to slide on the rail until it becomes dismembered from the latter.

Another main drawback associated with conventional sash-type window assemblies is the difficulty in aligning the window with the window frame. Also, it is often difficult to assemble the pivot assembly to the window frame.

Sash sag first occurs in casement and awning windows when the sash portion of the window is out of alignment with the frame. This misalignment between the window sash and frame can be caused by numerous factors including faulty installation of the window unit, settling of the building, warpage caused by weathering or other factors.

A window having sash sag is not properly sealed and will potentially allow wind, moisture and dust to enter the building. This can disrupt the interior temperature and humidity as well as increase the amount of dust and germs. In turn, increased moisture, wind and dust not only disrupts the internal environment but can also cause damage to personal property. Furthermore, if sash sag is not corrected, moisture will seep into the broken seal and cause structural damage to the window frame and the surrounding supporting wall.

The prior art has shown some example of devices for providing adjustment to window sashes in order to correct misalignment with the corresponding window frames. However, such prior art devices are typically labor intensive, often requiring some disassembly of the hinge to make adjustments. This increases the time necessary for adjustment in the cost of producing complex adjustment devices.

Accordingly, there exists a need for an improved window hinge. It is a general object of the present invention to provide an improved window hinge.

Advantages of the present invention include that the proposed window hinge is provided with features allowing to withstand and/or resist loadings imparted thereon by weather conditions such as strong winds. More specifically, the proposed window hinge reduces the risk that the shoe component will slide out of the supporting rail and be dismembered from the latter.

Also, the proposed window hinge is provided with features for facilitating attachment of the linkage arm to the track arm through a set of quick and ergonomical steps without the need for special tooling or manual dexterity. Furthermore, the proposed window hinge allows for adjustment of the relative positioning between the supporting and track arms, typically through a range of 1.5 mm. or less. The adjustment can be effected through a set of quick and ergonomical steps without requiring special tooling or manual dexterity.

Still furthermore, the proposed window hinge is specifically designed so as to provide the hereinabove mentioned features while being manufacturable through a set of conventional manufacturing steps, using conventional material so as to provide a window hinge that will be economically feasible, long lasting and relatively trouble free in operation.

BRIEF DESCRIPTION OF THE DRAWINGS:

An embodiment of the present invention will now be disclosed, by way of example, in reference to the following drawing in which:

FIGURE 1: in a top view, illustrates a sash arm, a support arm and a shoe, all part of a window hinge assembly, in accordance with an embodiment of the present invention, pivotally attached together;

FIGURE 2: in a longitudinal cross sectional view, illustrates the configuration of the support arm shown in FIG. 1;

FIGURE 3: in a top view, illustrates a track, part of a window hinge assembly, in accordance with an embodiment of the present invention;

FIGURE 4: in a partial perspective view, illustrates a portion of the track shown in FIG. 3;

FIGURE 5: in a partial exploded and longitudinal cross sectional view, illustrates the relationship between the track shown in FIG. 3 and attachment components used for attaching the support arm thereto;

FIGURE 6: in a side view, illustrates the combination of a sash arm, a support arm and a shoe such as shown in FIG. 1;

FIGURE 7: in a side view, illustrates a track such as shown in FIG. 3 having attachment components such as shown in FIG. 5 mounted thereto;

FIGURE 8: in a side end view, illustrates the relationship between the shoe component shown in FIG. 6 and the track component shown in FIG. 7 when assembled together;

FIGURE 9: in a side end view, illustrates the relationship between the shoe component shown in FIG. 6 and a second version of track component showing a blocking mean for blocking the shoe when assembled together;

FIGURE 10: in a side end view, illustrates the relationship between the shoe component shown in FIG. 6 and yet a third version of track component showing a blocking mean for blocking the shoe when assembled together.

DETAILED DESCRIPTION:

Referring to the drawings, there is shown various components part of a window hinge in accordance with an embodiment of the present invention. Typically, the window hinge is intended to be used in association with a window frame and a window sash (both not shown). The window sash and window frame may be formed out of any suitable material, such as wood, metal or polymeric resin.

Typically, the window frame has an inner side defined by wall and at its upper end is shaped with a recess to receive a weather stripping material. An outer wall of the window frame co-acts with an internal wall and a transverse wall to define a recess which receives a part of the window hinge. The window sash typically has an inner wall which abuts against the weather stripping in the recess of the wall and an outer wall, shaped at its lower end to provide a recess for receiving weather stripping that will tightly engage the outer wall of the frame when the window is closed. An internal wall of the window sash as well as a transverse wall

define a recess for receiving part of the window hinge (all not shown).

It should however be understood that the proposed window hinge could be used in other setting with other types of window frames and window sashes without departing from the scope of the present invention.

Referring now more specifically to FIGS. 3 through 5 and 7, there is shown that the window hinge embodying the present invention typically includes a track (10) mountable to the window frame. As shown more specifically in FIGS. 1, 2 and 6, the window hinge embodying the present invention typically also includes a sash arm (12) for mounting to the window sash, a support arm (14) for linking the sash arm (12) to the track (10) and a shoe (16) also for linking the sash arm (12) to the track (10).

As shown more specifically in FIGS. 3, 4, 7 and 8, the track (10) includes a track base wall (18) and at least one track flange (20) extending generally perpendicularly from a longitudinal peripheral edge thereof. Optionally, the track (10) could be provided with a pair of track flanges (20) extending from both longitudinal ends thereof without departing from the scope of the present invention. Each track flange (20) includes a flange spacing segment (22) extending generally perpendicularly relative to the track base wall (18) and a generally L-shaped flange retaining segment (24) extending from a distal segment of the flange spacing segments (22). The retaining segment (24), in turn, defines a first retention arm (26) extending generally perpendicularly from the spacing arm (22) when a second retaining segment (28) extending generally in a general parallel relationship relative to the spacing arm (22) in a spaced relationship relative thereto.

The track base wall (18) is also provided with a set of base wall apertures (30) extending therethrough for receiving corresponding fixing components, such as

screws or the like, insertable into the window frame for fixing the track (10) the latter.

As shown more specifically in FIGS. 1 and 6, the sash arm (12) is provided with a set of sash arm apertures (32) extending therethrough for receiving fixing components, such as screws or the like, insertable into the window sash for attaching the sash arm (12) to the latter. The sash arm (12) is also optionally provided with an abutment prong (34) extending therefrom for limiting the pivotal movement of the support arm (14) relative to the sash arm (12).

The support arm (14) defines a support arm first end (36) and a support arm second end (38). The support arm (14) is pivotally attached adjacent the support arm first end (36) to the sash arm (12) at a position typically intermediate the sash arm longitudinal ends. A sash-to-support arm pivotal link (38) typically including a rivet (40) or the like is used for pivotally connecting the support arm (14) to the sash arm (12).

The shoe (16) is pivotally connected to the sash arm (12) typically adjacent one of its longitudinal ends by a shoe-to-sash arm linking means (42) typically including a rivet (44) or the like.

As illustrated more specifically in FIG. 8, the shoe (16) typically has a generally irregular rectangular cross sectional configuration. The shoe (16) defines a shoe first main surface (46) and a generally opposed shoe second main surface (48). The shoe first main surface (46) is provided with a shoe recess (50) formed therein for slidably receiving the retaining section second segment (28) therein so as to allow the shoe (16) to be slidably mounted on the track (10) for slidable movement therealong. The hinge assembly described so far, is generally similar to the conventionally known hinge assemblies.

One of the features of the present invention resides in the presence of a shoe blocking means for blocking movement of the shoe (16) upon a negative pressure being applied to the window attached to the sash arm (12). The shoe blocking means may take any suitable form including a shoe blocking protrusion (52) protruding from an upper surface of the track base wall (18) or a second form containing a third retaining segment (51) shown in figure 9 as a shoe blocking mean or a third form containing a forth retaining segment (53) shown in figure 10 or a combination of these elements. The shoe blocking protrusion (52) is positioned along the track base wall (18) so as to be in frictional contact with the shoe (16) when the hinge assembly is in its closed configuration, illustrated in FIGS. 6 through 8.

The shoe (16) is provided with a correspondingly shaped shoe blocking recess (54) formed in the shoe second main surface (48) for receiving the shoe blocking protrusions (52).

Typically, although by no means exclusively, the shoe blocking protrusion (52) is formed by punching a suitable portion of the track base wall (18). Also, typically, although by no means exclusively, the shoe blocking protrusion (52) takes the form of a generally hemi-domed shaped protrusion defining an abutment apex (56) for frictional contact with the shoe (16). The combination of the shoe blocking protrusion (52) and the shoe blocking recess (54) are adapted to act as a blocking means for blocking the shoe (16) and preventing its withdrawal from the track (10) when a negative pressure is applied on the window to which the sash arm (12) is attached.

Another feature of the present invention resides in the presence of an adjustable support arm-to-track pivotal attachment means (58) for pivotally attaching the support arm (14) adjacent the support arm second end (38) to the track (10) while allowing adjustability of the pivotal link therebetween. As illustrated more

specifically in FIG. 5, the adjustable linking means (58) typically includes a mounting pin (60) for mounting a pressure clip (62) to an elevated section (64) of the track base wall (18). The pressure-type attachment clip (62) is of the conventional type including a clamp base disc (66) and clamping prongs (68) extending therefrom. The prongs (68) are resiliently spaced relative to each other so as to be snappingly insertable within a clamp receiving aperture (70) formed in the support arm (14) adjacent the support arm second end (38). The prongs (68) are provided with retaining flanges (72) for retention within corresponding tapered flange receiving sections (72) of the aperture (70).

One of the main features of the adjustable linking means (58) resides in that the pin (60) extends in a pin aperture (74) formed in the disc (66) that is offset relative to the latter. Hence, rotational movement of the disc (66) and, hence of the mounting bracket (62) relative to the track base wall (18) will cause the outer surface of the prongs (68) to move according to arrow (76) in FIG. 7 relative to the pivotal axis (78) of the pin (60).


Hence, in use, by merely rotating the component (62) using a conventional tool, such as a pliers, a ratchet or the like, fine adjustments in the order of 1.5 mm or the like of the relative positioning between the support arm (14) and the track (10) can be accomplished. Also, by using a pressure-type attachment bracket or clamp (62), mounting of the support arm (14) to the track (10) is greatly facilitated.

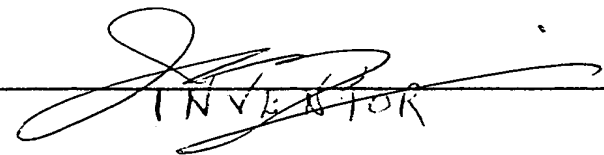
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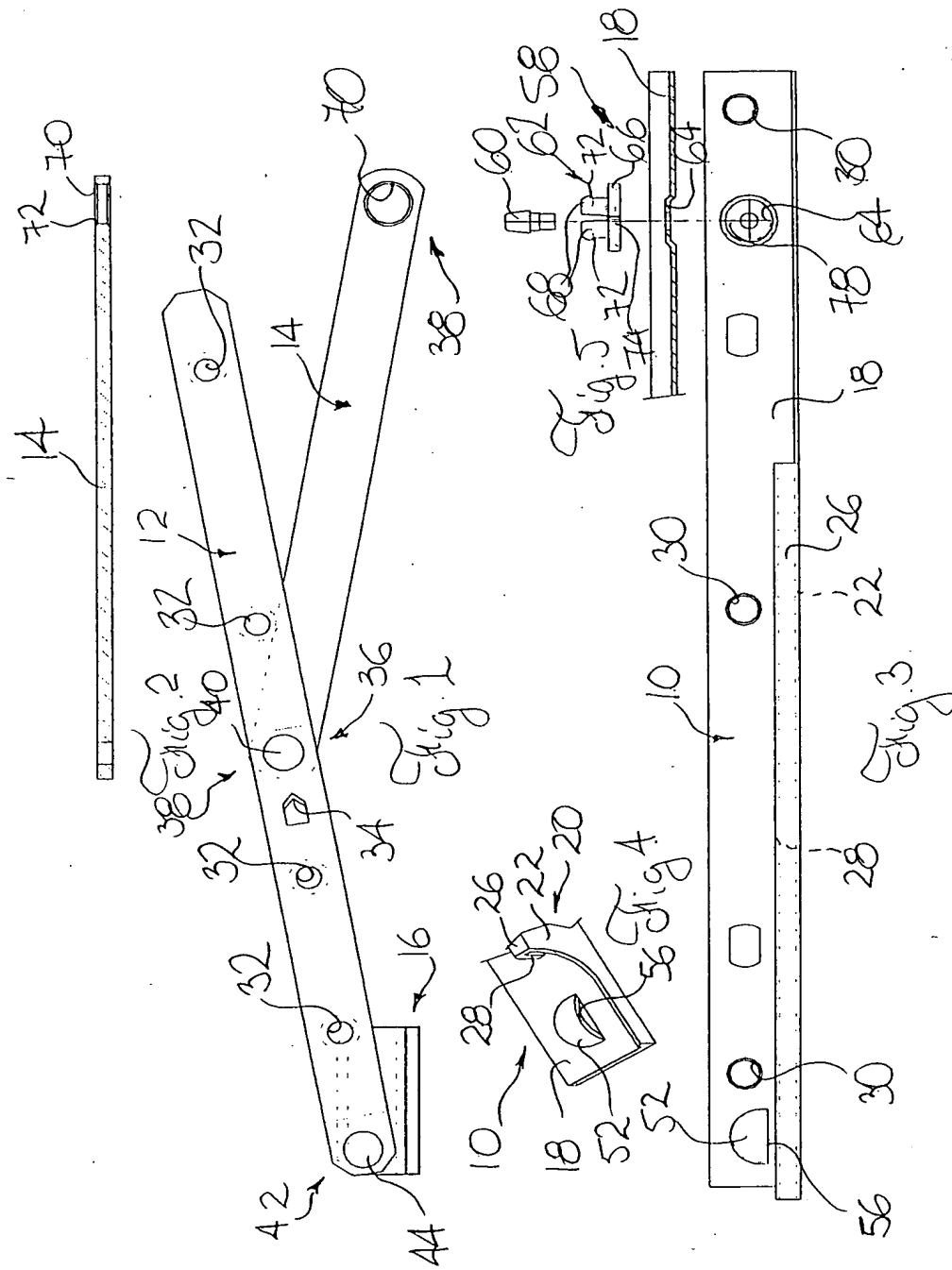
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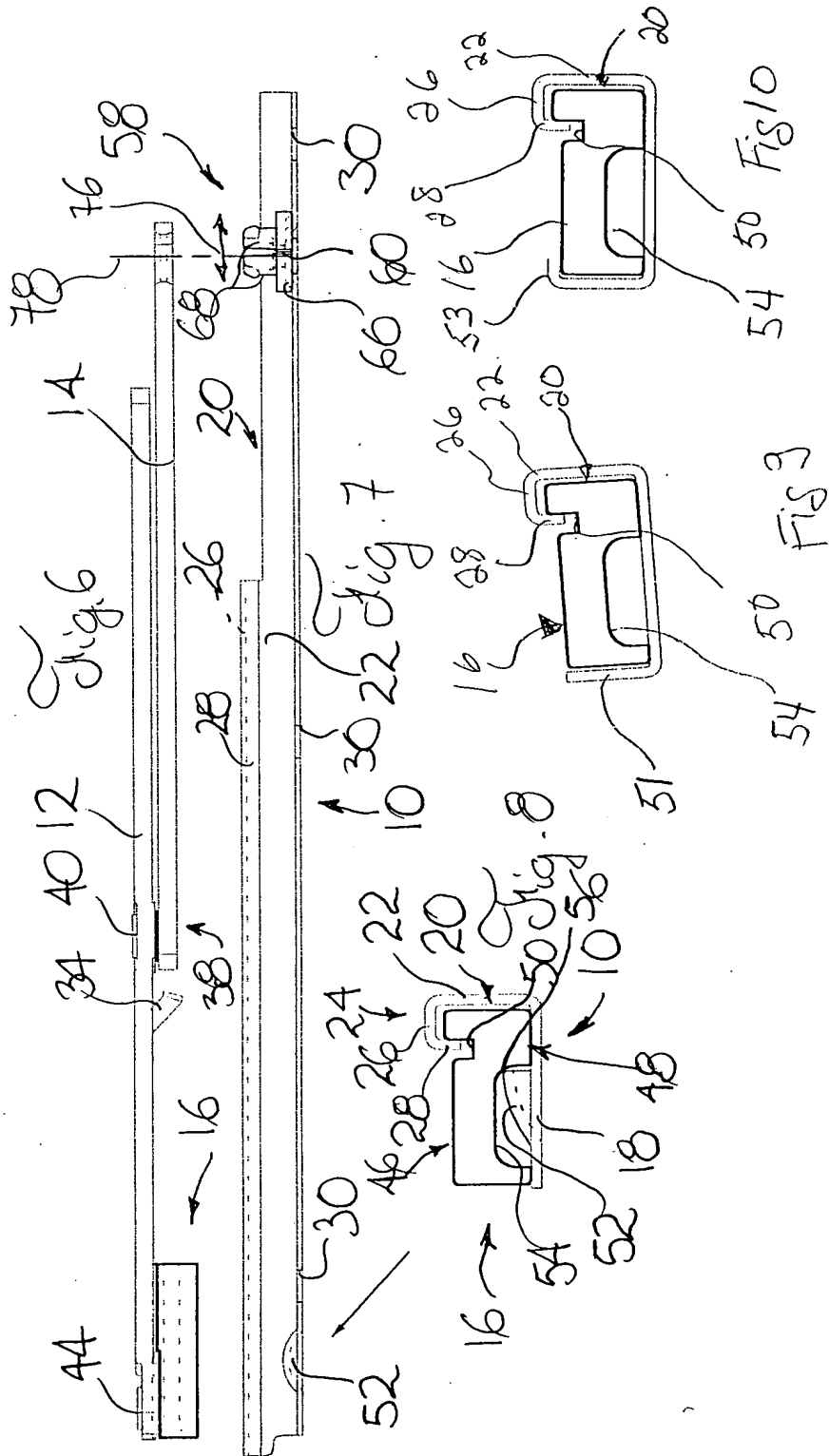
Jean Dupuis, Inventor


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